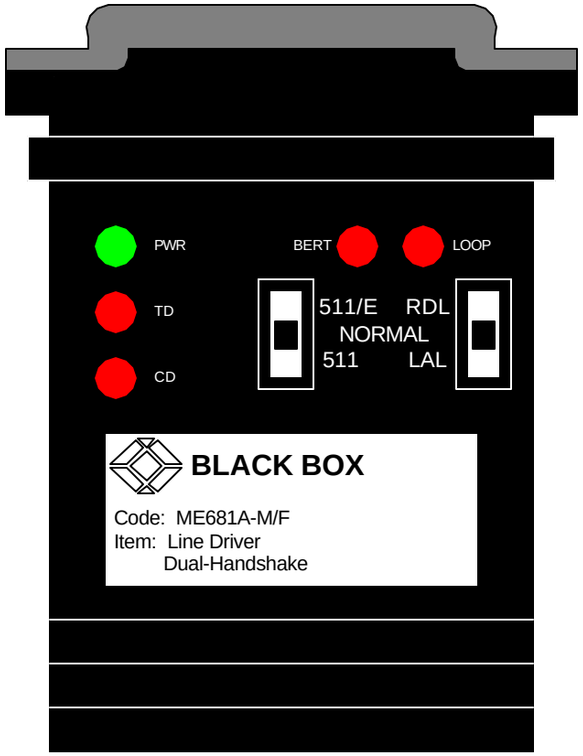
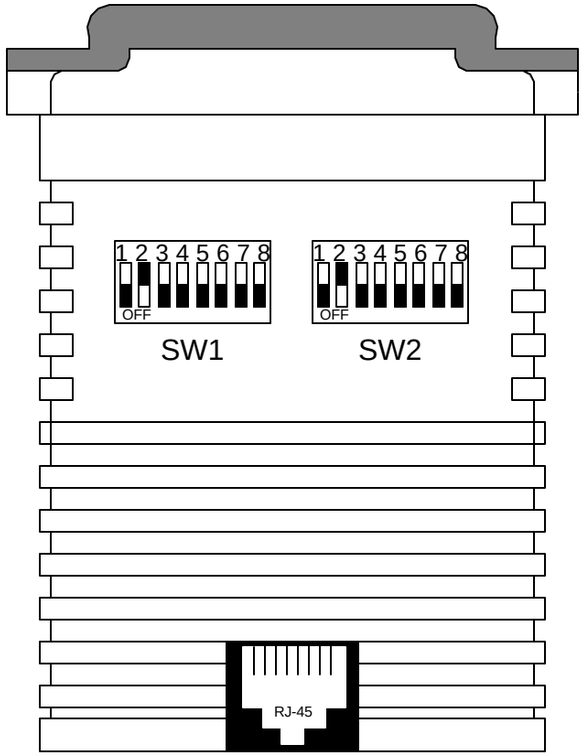
ME681A-M/F





INTRODUCTION:

The Line Driver--Dual Handshake high-speed short-range modem passes two in-band flow-control signals (DTR/DCD), as well as two channel-independent out-of-band flow-control signals (RTS/CTS). This makes the Dual Handshake suitable for SLIP (Serial Line Internet Protocol) and PPP (Point-to-Point Protocol) applications, as well as other serial applications requiring extra controls.

The Dual Handshake supports asynchronous data rates up to 57.6 Kbps and distances up to 2.4 miles (3.9 km) over two twisted pairs. Diagnostics include V.54 loopback tests, a built-in V.52 BER test generator, and tri-state LED indicators. Communication is protected from transient surges by built-in surge protectors, and from ground loops by 1500 V RMS isolation transformers.

The Dual Handshake's miniature size allows the unit to plug directly into the RS-232 port of a host, terminal server, PC, or other device. Power is supplied to the unit by a wallmount AC transformer. Configuration is facilitated by two sets of internally accessible DIP switches.

CONFIGURATION:

The Line Driver–Dual Handshake provides sixteen configuration switches, which allow selection of data rates, clocking methods, V.54 test modes, and extended signaling rates.

Configuration Switches:

The Dual Handshake's set of sixteen internal DIP switches allows configuration to an extremely wide range of applications. These switches are grouped into two eight-switch sets and are located on the inside of the unit. All possible settings for the Line Driver--Dual Handshake's configuration switches are presented in the summary table on the next page.

SPECIFICATIONS:

Asynchronous Data Rates: From 1,200 to 57,600 bps (switch-selectable)

Link Clocking: Internal only/76,800 bps (fixed)

Diagnostics: V.52-compliant bit error rate pattern; V.54-compliant: RDL and LAL, activated by front-panel switch or via terminal interface.

Internal Interface: Connection to MicroRack (RM202, RM204, RM208, or RM216) chassis via male card edge.

Line Interface: Twisted Pair.

Connectors: DB25 female or male on RS-232 side; RJ-45 on line side.

Transmission Format: Asynchronous to terminals; Synchronous between units.

Transmission Line: 4-wire unshielded twisted pair (UTP), 19-26 AWG.

Leads Supported: 1 thru 8, and 20.

Operating Mode: Point-to-Point

Operation: Full Duplex.

Transformer Isolation: 1500 V RMS.

Surge Protection: 600 W power dissipation at 1 msec. and response time of 1 picosecond.

Controls: Carrier constantly "ON" or "Controlled by DTR".

RTS/CTS Delay: No Delay.

Indicators: (5) LED's: PWR, TD, CD, BERT, LOOP.

BERT: 100% compliance with V.52, including 511 and 511/E bit-pattern generation (switch-selectable).

SUMMARY TABLE			
POSITION	**FUNCTION**	**FACTORY DEFAULT**	
Switch S1-1	DTE Control of LAL	OFF	Disabled
Switch S1-2	DTE Control of RDL	OFF	Disabled
Switch S1-3	Not Used	OFF	N/A
Switch S1-4	Microprocessor Reset	OFF	Normal
Switch S1-5 Switch S1-6 Switch S1-7	Data Rate Data Rate Data Rate	ON ON ON	57.6 Kbps
Switch S1-8	V.52/V.54 Tests	OFF	Enabled

S1-1: Determines whether or not the unit's LAL test can be initiated by raising pin 18 on the DTE.
ON = Pin 18 Initiation Enabled
OFF = Pin 18 Initiation Disabled

S1-2: Determines whether or not the unit's RDL test can be initiated by raising pin 21 on the DTE
ON = Pin 21 Initiation Enabled
OFF = Pin 21 Initiation Disabled

S1-3: Not Used

S1-4: May be used to reset the microprocessor and associated circuitry. The switch should remain in the OFF position for normal operation
ON = Reset Microprocessor
OFF = Normal Operation

S1-5 through S1-7: Are set in combination to determine the asynchronous DTE data rate for the unit. Refer to baud rate settings below.

S1-8: Determines whether or not the unit's V.54 circuits are enabled.
ON = V.54 Test Functions Disabled
OFF = V.54 Test Functions Enabled

BAUD RATE SETTINGS: S1-5 THROUGH S1-7			
S1-5	**S1-6**	**S1-7**	**SETTING**
OFF	OFF	OFF	1,200 bps
ON	OFF	OFF	2,400 bps
OFF	OFF	ON	4,800 bps
ON	OFF	ON	9,600 bps
OFF	ON	OFF	19,200 bps
ON	ON	OFF	28,800 bps
OFF	ON	ON	38,400 bps
ON	ON	ON	57,600 bps

SUMMARY TABLE			
POSITION	**FUNCTION**	**FACTORY DEFAULT**	
Switch S2-1 Switch S2-2 Switch S2-3	Not Used Not Used Not Used	OFF OFF OFF	N/A
Switch S2-4 Switch S2-5	Clock Source Clock Source	ON ON	Internal
Switch S2-6	Carrier Control	ON	DTR Controlled
Switch S2-7 Switch S2-8	RTS/CTS Delay RTS/CTS Delay	OFF OFF	No Delay

S2-1 through S2-3: Not Used

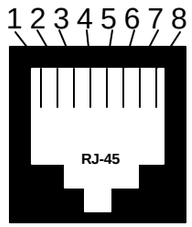
S2-4 and S2-5: Are set in combination to determine the synchronous link clock source for the unit. The unit may be set for either internal clock or receive recover clock.

S2-4	S2-5	Setting:
ON	ON	Internal Transmit Clock
OFF	ON	Receive Recover Clock

S2-6: Determines whether the carrier is "constantly on" or "controlled by DTR". This setting allows for operation is switched-carrier, multipoint, or hardware-handshaking applications.
OFF = Constantly ON
ON = Controlled by DTR

S2-7 and S2-8: RTS/CTS Delay:

S2-7	S2-8	Setting:
OFF	OFF	No delay. No other valid settings



INSTALLATION:

Once the LineDriver--Dual Handshake is properly configured, it is ready to connect to your system.

Connection to the Twisted-Pair Interface:

The Line Driver--Dual Handshake supports communication between two RS-232 devices at distances up 2.4 miles (3.9 km) and data rates up to 57.6 Kbps. Here are the two essential requirements for installing the unit.

1. These units work in pairs. You *must* have one Line Driver--Dual Handshake (or a compatible model) at each end of a two-twisted-pair interface.
2. To function properly, the Dual Handshake needs two twisted pairs of metallic wire. These twisted pairs must be unconditioned, dry, metallic wire, between 19 and 26 AWG (the higher-numbered gauges may limit distance somewhat). Standard dial-up telephone circuits, or leased circuits that run through signal-equalization equipment, or standard, flat modular telephone type cable, are not acceptable.

Twisted-Pair Connection Using RJ-45:

The RJ-45 connector on the Dual Handshake's twisted-pair interface are pre-wired for a standard telco wiring environment. When connecting two Line Driver--Dual Handshakes, it is necessary to use a twisted-pair "crossover" cable. The table below shows how a crossover cable should be constructed for an environment where both Dual Handshakes use a 8-wire RJ-45 connector.

SIGNAL	PIN NO.	PIN NO.	SIGNAL
N/C	1	8	N/C
GND	2	7	GND
RCV-	3	5	XMT-
XMT+	4	6	RCV+
XMT-	5	3	RCV-
RCV+	6	4	XMT+
GND	7	2	GND
N/C	8	1	N/C

Connection to the RS-232 Interface:

Once you have connected the twisted-pair wires correctly, simply plug the unit directly into the DB25 port of the RS-232 device.

1. The Line Driver--Dual Handshake is wired as a DCE, and therefore "wants" to plug into a DTE such as a terminal, PC, or host. A direct connection to the RS-232 DTE port is most desirable.
   If you must use a cable to connect the unit to the DTE port, make sure it is a straight-through cable of the shortest possible length-- we recommend 6 feet (1.8 m) or less.
2. Since the Dual Handshake is wired as a DCE, you cannot connect it directly to another DCE such as a modem or multiplexor. If you need to connect the unit to another DCE RS-232 device, you must use a null-modem cable. We recommend a cable of the shortest possible length, preferably 6 feet (1.8 m) or less.

OPERATION:

Once the Dual Handshake is properly configured and installed, it should operate transparently--as if it were a standard cable connection. The Dual Handshake is powered by a 7.5 VDC external wall-mount transformer.

Front-Panel Switches:

During normal operation, both front-panel switches should be in the "NORMAL" center position.

LED Status Monitors:

The Dual Handshake features five front-panel LED's that monitor transmit data, carrier detect, the two test modes, and power.

Test Modes:

Local Analog Loopback (LAL) test checks the operation of the local unit, and is performed separately on each unit.

The Remote Digital Loopback (RDL) test checks the performance of both the local and remote units, and the communication link between them.